

## ABSTRACT OF THE DISCLOSURE

In a first aspect, the present invention features methods for differentiating DNA species originating from different individuals in a biological sample. These methods may be used to differentiate or detect fetal DNA in a maternal sample or to differentiate DNA of an organ donor from DNA of an organ recipient. In preferred embodiments, the DNA species are differentiated by observing epigenetic differences in the DNA species such as differences in DNA methylation. In a second aspect, the present invention features methods of detecting genetic abnormalities in a fetus by detecting fetal DNA in a biological sample obtained from a mother. In a third aspect, the present invention features methods for differentiating DNA species originating from an organ donor from those of an organ recipient. In a fourth aspect, the present invention features kits for differentiating DNA species originating from different individuals in a biological sample.